Calendar No. 81

99TH CONGRESS
1st Session

SENATE

REPORT
99-31

NATIONAL BUREAU OF STANDARDS AUTHORIZATION

APRIL 16 (legislative day, APRIL 15), 1985.—Ordered to be printed

Mr. DANFORTH, from the Committee on Commerce, Science, and Transportation, submitted the following

REPORT

[To accompany S. 796]

The Committee on Commerce, Science, and Transportation to which was referred the bill (S. 796) to authorize appropriations to the Secretary of Commerce for the program of the National Bureau of Standards for fiscal year 1986, and for other purposes, having considered the same, reports favorably thereon with amendments and recommends that the bill do pass.

PURPOSE OF BILL

The bill, as reported, authorizes appropriations of $129,656,000 for fiscal year 1986 for the National Bureau of Standards (NBS), and $2,715,000 for fiscal year 1986 for the Office of Productivity, Technology, and Innovation.

BACKGROUND AND NEEDS

The NBS the Nation's oldest national laboratory, was established by Congress in 1901. The National Bureau of Standards Organic Act of 1901 (Public Law 56-177), as amended in 1950, sets forth the primary mission of the Bureau, which is to develop national standards of measurement for use in scientific research, engineering, manufacturing, and commerce. These standards provide the basis for the exchange of goods, accurate specification and compatibility of products, and quality control methods for production.

The Bureau's role of providing accurate and reliable standards provides for equity in trade and commerce, progress in science and technology, improved product quality and industrial productivity, and improved competitiveness in international markets.

51-010

S263-8

LEGISLATIVE HISTORY

Senator Gorton, chairman of the Subcommittee on Science, Technology, and Space, introduced S. 796 on March 28, 1985. The bill is cosponsored by Senator Riegle.

The Subcommittee on Science, Technology, and Space held a hearing on the proposed fiscal year 1986 budget for the Bureau on March 26, 1985. Witnesses at the hearing included representatives of the Federal Government and a diverse group of private firms and associations interested in the Bureau's programs.

S. 796 was ordered reported with amendments by the Committee on April 2, 1985.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, April 8, 1985.

Hon. JOHN C. DANFORTH,
Chairman, Committee on Commerce, Science, and Transportation, U.S. Senate, Dirksen Senate Office Building, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the attached cost estimate for S. 796, the National Bureau of Standards Authorization Act for Fiscal Year 1986.

If you wish further details on this estimate, we will be pleased to provide them.

With best wishes,
Sincerely,

RUDOLPH G. PENNER,
Director.

CONGRESSIONAL BUDGET OFFICE—COST ESTIMATE

1. Bill number: S. 796.

2. Bill title: National Bureau of Standards Authorization Act for Fiscal Year 1986.

3. Bill status: As ordered reported by the Senate Committee on Commerce, Science and Transportation, April 2, 1985.

4. Bill purpose: S.796 authorizes the appropriation of $129.7 million for fiscal year 1986, plus such additional sums as may be necessary for adjustments in salary, pay, retirement and other employee benefits, for the activities of the National Bureau of Standards (NBS). In addition, the bill authorizes 1986 appropriations of $2.7 million for the Office of Productivity, Technology and Innovation (OPTI), $0.5 million for the National Technical Information Service (NTIS), and $0.6 million for expenses incurred abroad to be paid in foreign currency. The bill would allow NBS to adjust fees for certain goods and services to cover estimated replacement costs, and would no longer require NTIS to use the Government Printing Office to reproduce certain scientific and technical publications. S.

796 would also change the compensation of the Director of NBS from Level V of the Executive Schedule to Level IV, effective upon enactment.

Fiscal year 1985 appropriations to date for the activities authorized by the bill are $127.8 million. The President's 1986 budget requests $122.5 million for these programs, $3.7 million for transfer for working capital.

5. Estimated costs to the Federal Government.

[By fiscal years, in millions of dollars]

	1986	1987	1988	1989	1990
Authorization level:					
Specified (Function 370)	133.5				
Estimated (Function 920)	2.2				
Total	135.7				
Estimated outlays:					
Function 370	91.7	37.8	4.0		
Function 920	2.0	0.2			
Total	93.7	38.0	4.0		

S. 796 would allow NBS to increase fees for certain reference and calibration services to recover replacement costs. NBS would be allowed to use these fees to replace inventories and equipment; any amounts collected in excess of replacement costs would be returned to the Treasury. According to NBS, additional fee collections of aproximately $1 million annually could be collected as a result of this provision, to be used for replacing inventories and equipment.

Basis of estimate: For purposes of this estimate it was assumed that the amounts authorized in the bill for 1986 would be appropriated prior to the beginning of the fiscal year. In addition, pay and other benefit increases of approximately $2.2 million in 1986 were estimated based on CBO's baseline projections. Outlays reflect historical spending patterns.

The change in the compensation of the Director of NBS would cost less than $5,000 annually, beginning in fiscal year 1985.

6. Estimated cost to state and local governments: None.

7. Estimate comparison: None.

8. Previous CBO estimate: None.

9. Estimate prepared by: Mary Maginniss.

10. Estimate approved by: James L. Blum, Assistant Director for Budget Analysis.

Regulatory Impact Statement

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation:

The bill, as reported, provides authorization of appropriations to the Secretary of Commerce to carry out programs of NBS including certain special statutory programs in fiscal year 1986.

The bill does not regulate business activity, or any private activity. The Committee concludes, therefore, that the implementation of

this bill will have no impact on the personal privacy of any individual or business. No records will be required to be kept by any individual or business, nor will any reports need to be filed as a result of the enactment of S. 796.

SECTION-BY-SECTION ANALYSIS

SECTION 1.—SHORT TITLE

This section cites the title as the "National Bureau of Standards Authorization Act for Fiscal Year 1986".

SECTION 2.—AUTHORIZATION FOR PROGRAM ACTIVITIES

This section authorizes appropriations totaling $129,656,000 for fiscal year 1986 for the programs of the NBS. The administration's budget request for the Bureau for fiscal year 1986 totaled $120,001,000. A breakdown of that request is contained in the following table:

TABLE 1.—COMPARISON OF FISCAL YEAR 1986 BUDGET REQUEST WITH FISCAL YEAR 1985 FUNDS AVAILABLE FOR NATIONAL BUREAU OF STANDARDS

[Amounts in millions]

	Fiscal year	
	1985	1986
Scientific and technical research and services:		
Measurement and engineering research and standards	$104,728	$96,258
Measurement research and standards	35,064	38,790
Materials science and engineering	19,375	22,580
Engineering measurements and standards	34,462	29,888
Computer sciences and technology	10,000	5,000
Fire research	5,827	.....
Competence and central technical support	19,257	23,743
Technical competence fund	8,598	8,532
Central technical support	10,659	15,211
Total requirements	123,985	120,001

The administration's fiscal year 1986 budget proposal represented a decrease of $3,984,000 from the fiscal year 1985 appropriation of $123,985,000. Three programs were proposed for cuts, as they were in 1984 and 1985. Congress restored funds for these programs in 1984 and 1985. The administration also proposed cuts in the NBS equipment budget, a 5 percent reduction in salaries, a reduction in the number of Bureau employees in Grades 11 through 15 of the General Schedule, and certain cuts in administrative activities. Four program increases were proposed.

Proposed cuts

1. The administration proposed eliminating the Center for Fire Research ($5,141,000).

The Center for Fire Research (CFR) was established by the Federal Fire Prevention and Control Act of 1974. The Center's work

includes research on the physics and chemistry of fire, the reaction of materials to fire, the effects of fire on its victims, and the development of improved engineering practices to render our human-made environment more resistant to fire. The Center is a leader in the development of mathematical fire models and computer simulation. In addition, the Center provides $2 million annually for fire research programs in universities and research institutions.

Although the Center does not promulgate or enforce standards or regulations, it does provide technical support to voluntary standards and model codes groups in the States, engineers and other designers, the building industry, fire services, fire protection organizations, and Federal agencies. For example, the Center's research was used by the Consumer Product Safety Commission (CPSC) to generate a flame-retardant standard for children's sleepwear.

The administration's rationale for eliminating the Center was that fire research is the responsibility of the private sector and State governments. The Committee for the third consecutive year rejects this argument. Based on hearing testimony and statements received for the hearing records in 1983, 1984, and 1985, the Committee concludes the following: State governments cannot build, staff, fund, or contract for comparable research facilities; even if they could, each State would duplicate the research programs of the other States, resulting in a waste of taxpayers' money; industry will not replicate the broad-based research performed by the Center because competition demands that industry research be profit-oriented; research performed by different competing segments within an industry would lack credibility; and Federal agencies would not have an objective expert to advise or assist them if the Center for Fire Research were eliminated.

2. The administration proposed eliminating the Center for Building Technology (CBT) ($3,100,000).

This Center provides the technical bases for building standards, codes, and specifications, and also conducts analytical, laboratory, and field research in engineering and physical sciences related to building construction. Its most visible projects have been analyses of the Kansas City, MO, Hyatt Regency skywalk collapse (1981) and the East Chicago, IN, highway ramp collapse (1982). The results of these types of investigations are provided to organizations that write building codes and standards. The Center also conducts research and provides technical support for development of seismic design and construction practices as mandated by the Earthquake Hazards Reduction Act of 1977.

The administration's argument for eliminating this Center is that building research is the responsibility of the private sector and State and local governments. The Committee for the third consecutive year rejects this argument for the same reasons it rejected the proposal to eliminate the Center for Fire Research. The Committee sees no evidence that the private sector or State and local governments could or would assume the role of carrying out primary research in the building sciences. Moreover, the Center for Building Technology is able to make unique contributions to the building industry because it is a neutral body. For example, the Occupational Safety & Health Administration (OSHA) revised its construction safety regulations based on the Center's research on pre-

venting excavation cave-ins at construction sites; and the Center's development of a method to measure the insulating value of thick insulation saved the thermal insulation industry $90 million per year in its efforts to comply with a Federal Trade Commission labeling requirement. In both of these examples the neutrality of the Center for Building Technology gave its research credibility. Private funds supporting the same research would not have the same effect.

3. The administration proposed a budget reduction of 50 percent (5 million) for the Institute for Computer Sciences and Technology (ICST). The Institute conducts its activities under the following authorities: the National Bureau of Standards Organic Act (Public Law 56-177); the Brooks Act (Public Law 89-306); the Paperwork Reduction Act of 1980 (Public Law 96-511); OMB Circular A-71, transmittal memo no. 1; and OMB Circular A-108. The Institute's major objectives including the following: developing national and international voluntary industry standards for computer products and services; developing uniform Federal standards for Federal Government purchase, lease, and operation of computers; and carrying out applied research and development.

Both the testimony received at the hearing and other communications to the Committee confirm the judgment of the Committee that the proposed reduction of 50 percent would have a drastic effect on the Institute's ability to perform its major objectives. If the $5 million cut were approved, the Institute would rely on voluntary standards organizations for the majority of computer-related Federal standards. Research and development in the following areas would be discontinued: computer security and risk management; programming languages; selection and management of computers; and software development and maintenance.

Neither Administration nor outside witnesses could identify a private sector organization which would be able to take the lead in coordinating and communicating with Federal agencies to determine the need for Federal standards and guidelines. Yet, the Federal Government is one of the largest users of computers. Cost-benefit studies prepared under contract for the NBS indicate that the estimated benefits to the Government resulting from the use of Federal information processing standards greatly exceed the cost of standards development by the Institute. For example, analysts estimate that the Government could possibly save more than $70 million by adopting a new standard the Bureau developed for the programming language COBOL.

The applied research and development carried out by the Institute is very important to America's productivity and its competitiveness with the rest of the world. The work of the Institute has led to increased productivity and reliability of software and hardware through conversion of older programs, data, and sytems into new forms. The Committee believes that the work performed by the Institute is timely and appropriate. The Committee bill, as reported, restores funding for the Institute at fiscal year 1985 authorization levels.

The Committee is displeased that the administration once again has proposed the elimination of the Fire and Building Centers and a 50 percent reduction in the budget for The Institute for Comput-

er Sciences and Technology. The Committee and the Congress have repeatedly rejected these proposed cuts, on the grounds that these operations are essential Federal activities. Moreover, the administration has not presented any written evidence to the private sector are willing and able to perform these activities.

4. The administration proposed a $3,265,000 reduction in the Bureau's equipment replacement fund.

This program was established in 1976 to increase the amount of funds available for replacement of equipment from an inadequate level of 3.5 percent of the Bureau's budget to approximately 10 percent. This was the minimum level found in comparable research laboratories. The Committee feels that the maintenance of quality, modern equipment is important to the Bureau's mission and only approved $1,265,000 of the administration's proposed $3,265,000 cut.

5. The administration proposed a 5 percent reduction in the fiscal year 1986 pay for NBS employees. The proposed reduction totalled $2,414,000.

The Committee rejects this proposal. The Federal budget deficit must be reduced, but not by placing disproportionate and unfair burdens on any one group, such as Federal employees.

6. The administration also proposed certain administrative budget reductions and a reduction in the number of Bureau employees in Grades 11 through 15 of the General Schedule. Because of the need to reduce the Federal budget deficit, the Committee agrees with the proposed administrative cuts, except, as noted, the proposed 5 percent pay reduction. The Committee does not object at this time to the proposed GS 11-15 reductions. The Committee will monitor this situation closely however. The Bureau is a technical agency which must attract and recruit high-quality professionals to perform its duties. Many of the scientists and engineers it relies upon are in the GS 11-15 range. If the proposed reduction adversely affects the ability of the Bureau to recruit and retain qualified personnel, the Committee will consider appropriate actions.

Proposed increases

1. The administration has proposed funding to expand the Bureau's program of measurements for process and quality control ($1,944,000). The Committee believes that process and quality control is the most fundamental service which the Bureau offers to industry. The Committee has included funding for this initiative.

2. The administration has proposed funding for an initiative in advanced ceramics research ($3,500,000). Ceramics offer potential as replacements for a wide variety of existing, more costly materials. U.S. industry is facing stiff competition in this area, with Japan already dominating ceramics for electronic components, controlling 50 percent of the $4.1 billion world market. Rapid growth is expected in ceramics with sales reaching $19 billion per year a decade from now.

The barrier to commercialization of these materials is the inability to control production processes so that ceramic products are uniform and predictable. The Bureau's effort will focus on the measurement services required to control the microcracks which

form in ceramics and which are the cause of unreliable performance. The Committee has included funding for this initiative.

3. The administration has proposed funding for an initiative in biotechnology ($3 million) to develop a scientific basis for the use of biotechnology in chemical production and related industries.

Biotechnology is a growing, economically important industry. Industry lacks detailed generic information on the behavior of biomolecules, however, especially in the chemical processes used to produce biotechnology products. This lack of information is a barrier to the efficient commercialization of biotechnology. The Bureau's effort will concentrate on the industrially significant areas of enzyme catalysis, chemical separations, and chemical analysis using biomolecules.

The Committee has included funding for this initiative. To ensure that the new biotechnology program concentrates on the most important scientific and technical questions, the Committee expects the Bureau to maintain strong peer review of the program. The Committee also encourages the Bureau to maintain close coordination with the research efforts of both industry and government, including the new Engineering Research Center on Biotechnology Process Engineering at the Massachusetts Institute of Technology. The Committee believes that such coordination is necessary to avoid duplication and to maximize program benefits. Finally, the Committee is pleased to see the Bureau involve a wide range of universities and other researchers in its biotechnology effort, and encourages the Bureau to continue to do so.

4. The Administration proposed funding for the construction of a cold neutron research facility ($8 million).

The Bureau has a reactor which it uses for research into properties of materials and nuclear physics. The Bureau will build a source of cold neutrons, as provided in its 1985 budget. The funds requested in fiscal year 1986 would be used to construct a cold neutron research facility adjacent to the reactor. This facility would consist of an experimental hall equipped with neutron beam handling tubes that will service 15 experimental stations. This would expand the Bureau's ability to study the properties, performance, and processing of materials, including metals, ceramics, and polymers.

The United States lags far behind other industrialized nations, especially Great Britain, France, and Germany, in the development of cold neutron research facilities, and in the research which such a facility would enable the United States to perform.

Although the Committee feels that cold neutron research is important to the Bureau's statutory mandate, it is not possible to eliminate important programs or to delay the start of other important initiatives to fund this project. Consequently, the Committee has not included funding for the cold neutron project.

SECTION 3.—OFFICE OF PRODUCTIVITY, TECHNOLOGY, AND INNOVATION

This section authorizes appropriations of $2,715,000 for fiscal year 1986 for the Office of Productivity, Technology, and Innovation (OPTI).

The primary goal of the OPTI is to stimulate increased technological innovation and productivity in the private sector. OPTI serves as the focal point for the development of policies and cooperative activities between government, universities, and industry in a variety of areas that influence industrial innovation and productivity. In addition, OPTI coordinates Federal patent policy, the voluntary conversion to the metric system, and the implementation of the Stevenson-Wydler Technology Innovation Act (Public Law 96-480).

In fiscal year 1986, the administration requested $1,762,000 for the Office's activities. These funds would be used for a phase-out of the Office to a small executive staff of approximately three people beginning in fiscal year 1987. The Committee plans to hold 2 days of hearings on the Stevenson-Wydler Technology Innovation Act and the role of the OPTI. At that time the Committee will evaluate the Office's performance. In the meantime, the Committee is authorizing the Office at the fiscal year 1985 appropriation level.

SECTION 4.—NATIONAL TECHNICAL INFORMATION SERVICE

This section amends the statutory authority of the National Technical Information Service (NTIS). Section 4(1) provides NTIS with authority to procure printing services at the most cost-effective rate.

Section 4(2) clarifies the authority of NTIS to purchase equipment and inventories from receipts for work or services performed or to be performed by NTIS.

SECTION 5.—AUTHORIZATION OF APPROPRIATIONS FOR THE NATIONAL TECHNICAL INFORMATION SERVICE

This section authorizes appropriations of $537,000 for fiscal year 1986 for the operation of NTIS's patent licensing program. This figure is the same as the revised fiscal year 1986 base for the program.

SECTION 6.—EXCESS FOREIGN CURRENCY

This section authorizes appropriations of $600,000 for National Bureau of Standards' foreign currency expenses incurred outside the United States, to be paid in foreign currencies determined to be excess to the normal requirements of the United States.

SECTION 7.—SALARY ADJUSTMENTS

This section authorizes appropriations of such sums as may be necessary for adjustments in salary, pay, retirement, and other employee benefits.

SECTION 8.—AVAILABILITY OF APPROPRIATIONS

This section makes appropriations available for the period or periods specified in the Acts making such appropriations.

SECTION 9.—COST RECOVERY AUTHORITY

This section amends the National Bureau of Standards Organic Act to:

1. allow the Bureau to retain proceeds from fee increases for its goods and services; and
2. allow the Bureau to use this net income from goods and services provided to industry and other Federal agencies to replace equipment and inventories before net proceeds are paid into the general fund of the Treasury.

SECTION 10.—COMPENSATION OF DIRECTOR

This section amends section 5 of the National Bureau of Standards Organic Act of 1961 to change the level of the Director of the Bureau from Level V to Level IV of the Executive Schedule.

The Director of NBS currently is paid less than many of the Director's Senior Executive Service subordinates. The Committee believes that this disparity is inappropriate. As a result, the bill would raise the Director to Level IV.

SECTION 11.—STRUCTURAL FAILURES

This section allows the Bureau to investigate structural failures after consultation with local authorities.

The Bureau's Center for Building Technology examines structural failures, including the collapse of buildings and bridges, where it believes that the causes are unclear and that the building community would benefit from a public report on the origins of the failure. That information in turn is made available to the engineering community and State and local officials. The Committee believes that these investigations are useful. NBS lacks formal statutory authority for such investigations, however.

The Committee does not want NBS to investigate all structural failures. Rather, the Committee directs the Bureau to continue its current policy of investigating only those structural failures that the Bureau believes are of unclear origin and general importance. Such investigations are to be initiated and conducted only after consultation with local authorities. The Bureau shall attempt to ascertain only the facts of a structural failure; it shall not attempt to ascertain blame or responsibility. It is not to attempt to regulate any activity. The findings of any such investigation are to be made public. No part of any report resulting from such an investigation shall be admitted as evidence or used in any suit or action for damages arising out of any matter mentioned in such report.

SECTION 12.—EFFECTIVE DATE

This section directs that section 9 and 10 of this act shall take effect on October 1, 1984. These two provisions were both included in the fiscal year 1985 NBS authorization bill which passed Congress last year (H.R. 5172). The President did not approve that bill, for reasons unrelated to these sections. As a result, the Committee believes that the two provisions should be made effective on October 1, 1984, as they would have been had the President approved H.R. 5172.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new material is printed in italic, existing law in which no change is proposed is shown in roman):

THE ACT OF SEPTEMBER 9, 1950

Section 2 of that Act

SEC. 2. The Secretary of Commerce (hereinafter referred to as the "Secretary") is hereby directed to establish and maintain within the Department of Commerce a clearinghouse for the collection and dissemination of scientific, technical, and engineering information, and to this end to take such steps as he may deem necessary and desirable—

(a) To search for, collect, classify, coordinate, integrate, record, and catalog such information from whatever sources, foreign and domestic, that may be available.

(b) To make such information available to industry and business, to State and local governments, to other agencies of the Federal Government, and to the general public, through the preparation of abstracts, digests, translations, bibliographies, indexes, and microfilm and other reproductions, *without regard to section 501 of title 44, United States Code,* for distribution either directly or by utilization of business, trade, technical, and scientific publications and services;

(c) To effect, within the limits of his authority as now or hereafter defined by law, and with the consent of competent authority, the removal of restrictions on the dissemination of scientific and technical data in cases where consideration of national security permit the release of such data for the benefit of industry and business.

(d) To acquire capital equipment and inventories from receipts for work or services performed or to be performed under this section.

THE ACT OF MARCH 3, 1901

Section 5 of that Act

SEC. 5. The director shall be appointed by the President, by and with the advice and consent of the Senate. He shall have the general supervision of the bureau, its equipment, and the exercise of its functions. He shall make an annual report to the Secretary of the Treasury, including an abstract of the work done during the year and a financial statement. He may issue, when necessary, bulletins for public distribution, containing such information as may be of value to the public or facilitate the bureau in the exercise of its functions. *The director shall be compensated at the rate now or hereafter in effect for level IV of the Executive Schedule, pursuant to section 5315 of title 5, United States Code.*

Section 12 of that Act

SEC. 12. (a)–(e) * * *

(f) The amount of any earned net income resulting from the operation of the fund at the close of each fiscal year shall be paid into the general fund of the Treasury: *Provided,* That such earned net income may be applied [first] to restore any prior impairment of the fund , *and to ensure the availability of working capital necessary to replace equipment and inventories.*

TITLE 5, UNITED STATES CODE

Section 5315 of that title

§ 5315. Positions at level IV

Level IV of the Executive Schedule applies to the following positions, for which the annual rate of basic pay shall be the rate determined with respect to such level under chapter 11 of title 2, as adjusted by section 5318 of this title:

* * * * * * *

Assistant Administrators, Environmental Protection Agency (8).

Director of Operational Test and Evaluation, Department of Defense.

Special Representatives for Arms Control and Disarmament Negotiations, United States Arms Control and Disarmament Agency (2).

Director, National Bureau of Standards, Department of Commerce.

Section 5316 of that title

§ 5316. Positions at level V

Level V of the Executive Schedule applies to the following positions, for which the annual rate of basic pay shall be the rate determined with respect to such level under chapter 11 of title 2, as adjusted by section 5318 of this title:

* * * * * * *

Director, Advanced Research Projects Agency, Department of Defense.

Director, Bureau of the Census, Department of Commerce.

Director, Bureau of Mines, Department of the Interior.

Director, Geological Survey, Department of the Interior.

[Director, National Bureau of Standards, Department of Commerce.]

Director of Science and Education, Department of Agriculture.

Deputy Commissioner of Internal Revenue, Department of the Treasury.

Assistant Directors, National Science Foundation (4).

Deputy Director, Policy and Plans, United States Information Agency.

Deputy General Counsel, Department of Defense.

* * * * * * *

○